Example 6a: Path Analysis for Mediation among Conditionally Multivariate Normal Outcomes

(complete syntax and output available for SAS, Mplus, and STATA electronically)

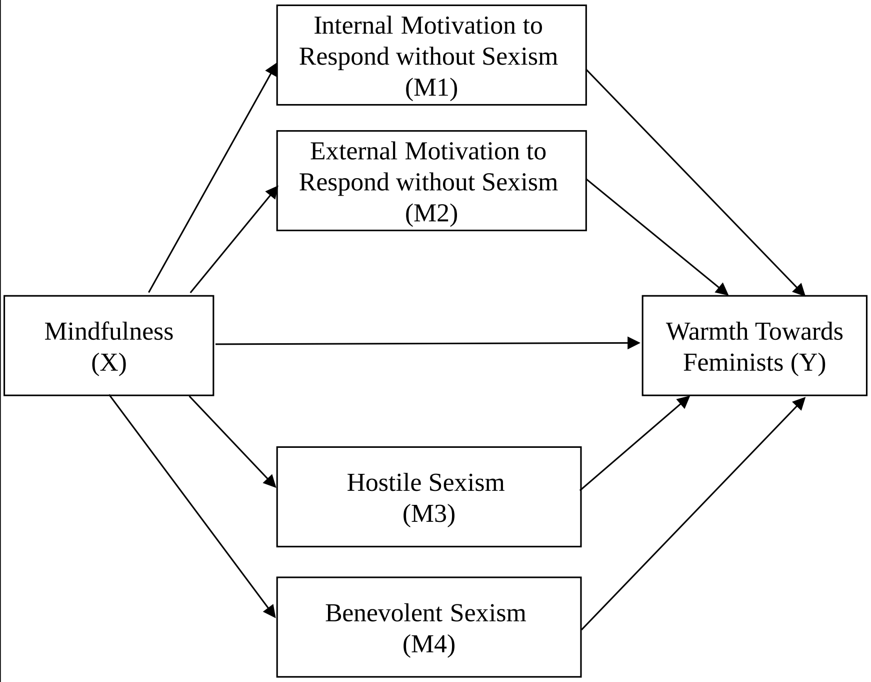

Figure 1 from: Gervais, S. J. & Hoffman, L. (2013). Just think about it: Mindfulness, sexism, and prejudice towards feminists. *Sex Roles*, *68*(5), 283-295.

A sample of 653 undergraduates completed the six measures depicted in Figure 1 (residual covariances among the mediators are not shown for diagram clarity). Table 3 shows the correlations of the six variables by gender.

The research questions were as follows: (1) To what extent do these four mediators account for the relationship between mindfulness and warmth towards feminists? (2) How do these direct and indirect effects differ by gender?

Accordingly, we will begin with a single-group model, and then examine a multiple-group model in which all parameters are estimated separately for men and women. From there, one would proceed by constraining specific direct and indirect effects to be equal across genders and note the decrease in model fit in doing so.

Table 3 Inter-correlations of all factors by participant gender for main study

	1.	2.	3.	4.	5.	6.
1. Mindfulness	–	**.20**	.10	**−.17**	−.08	**.15**
2. Internal motivation	.04	–	**.39**	.06	**−.40**	**.45**
3. External motivation	−.04	**.38**	–	**.14**	.05	.11
4. Benevolent sexism	.08	−.01	**.17**	–	.07	−.06
5. Hostile sexism	**−.11**	**−.21**	.03	**.20**	–	**−.44**
6. Warmth toward feminists	−.00	**.30**	**.14**	−.08	**−.24**	–

Bold font denotes significant correlation coefficients. Correlations for men (N=272–273) are reported above the diagonal and correlations for women (N=378–380) are reported below the diagonal. Mindfulness (1 = *rarely*, 4 = *almost always*), Warmth Toward Feminists (0° = *very coolly*, 100° = *very warmly*), and Internal Motivation, External Motivation, Hostile Sexism, Benevolent Sexism (1 = *disagree strongly*, 7 = *agree strongly*)

SAS PROC CALIS Syntax for Single-Group Path Model:

```
TITLE1 "SAS Single-Group Path Model with Indirect Effects";
PROC CALIS DATA=work.Mindfull MEANSTR METHOD=FIML;
* VAR = List of variables in model;
  VAR  MindC Intern Extern Hostile Benev Nontrad;
* MEAN = Labeling means/intercepts per variable;
  MEAN MindC=Xint, Intern=M1int, Extern=M2int, Hostile=M3int, Benev=M4int, NonTrad=Yint;
* PVAR = Labeling variances/residual variances per variable;
  PVAR MindC=Xvar, Intern=M1var, Extern=M2var, Hostile=M3var, Benev=M4var, NonTrad=Yvar;
* PCOV = Requesting and labeling residual covariances;
  PCOV Intern Extern=CovM12, Intern Hostile=CovM13, Intern Benev=CovM14,
       Extern Hostile=CovM23, Extern Benev=CovM24, Hostile Benev=Cov34;
```

```
* PATH = Model specification and labels;
  PATH MindC ---> NonTrad = mXtoY,
       MindC ---> Intern Extern Hostile Benev = XtoM1 XtoM2 XtoM3 XtoM4,
       Intern Extern Hostile Benev ---> NonTrad = M1toY M2toY M3toY M4toY;
* TESTFUNC = Requesting indirect effects;
  TESTFUNC XtoM1toY XtoM2toY XtoM3toY XtoM4toY;
           XtoM1toY = XtoM1*M1toY; XtoM2toY = XtoM2*M2toY;
           XtoM3toY = XtoM3*M3toY; XtoM4toY = XtoM4*M4toY;
RUN; TITLE1;
```

Mplus Syntax and Partial Output for Single-Group Path Model:

```
TITLE:  Mplus Example 6a Multiple-Group Path Model with Indirect Effects
DATA:   FILE IS Mindfull_Example.csv; ! Can just list file name if in same folder
        FORMAT = free;                ! FREE (default) or FIXED format
        TYPE = individual;            ! Individual (default) or matrix data as input
VARIABLE:
! Names of all variables in data set
  NAMES ARE pin1 SexMW age Mind1 Mind2 Hostile Benev Intern Extern
            NonTrado Career Fem WomMov;
! Names of all variables in model
  USEVARIABLES ARE SexMW Intern Extern Hostile Benev MindC NonTrad;
! Missing data indicator
  MISSING ARE ALL(-999);

DEFINE:
! Center mindfulness at 2 (out of 1 to 4)
  MindC = Mind1 - 2;
! Mean of feminists and womens' movement
  NonTrad = (Fem + WomMov) / 2;

ANALYSIS:   TYPE IS GENERAL;          ! For path models
            ESTIMATOR IS ML;          ! Regular ML for use with bootstrapping
            !BOOTSTRAP IS 1000;       ! Bootstrapping for indirect effects
OUTPUT:     STDYX;                    ! Standardized solution
            !MODINDICES (3.84);       ! Test constraints without bootstrapping
            CINTERVAL;                ! Confidence interval for indirect effects
            !CINTERVAL(BCBOOTSTRAP); ! Bootstrap CI for indirect effects

! Model code: ON = Y ON X, WITH = correlation (labels to do math on)
MODEL:
! Bring X into the likelihood by estimating its mean and variance
  [MindC] (Xint); MindC (Xvar);
! Intercepts and residual variances for other variables
  [Intern Extern Hostile Benev NonTrad] (M1int M2int M3int M4int Yint);
   Intern Extern Hostile Benev NonTrad  (M1var M2var M3var M4var Yvar);
! Direct MindC --> NonTrad
  NonTrad  ON MindC (XtoY);
! Left side of model
  Intern Extern Hostile Benev  ON MindC (XtoM1 XtoM2 XtoM3 XtoM4);
! Right side of model
  NonTrad ON Intern Extern Hostile Benev (M1toY M2toY M3toY M4toY);
! Residual covariances among mediator variables
  Intern Extern Hostile Benev WITH Intern Extern Hostile Benev;
! Testing indirect effects
  MODEL CONSTRAINT:
  NEW (XtoM1toY XtoM2toY XtoM3toY XtoM4toY);
  XtoM1toY = XtoM1*M1toY; XtoM2toY = XtoM2*M2toY;
  XtoM3toY = XtoM3*M3toY; XtoM4toY = XtoM4*M4toY;

! Get all indirect effects between Y IND X
MODEL INDIRECT: ! Only available for MVN outcomes
NonTrad IND MindC;
```

```
MODEL FIT INFORMATION
Number of Free Parameters                       27
Loglikelihood
          H0 Value                       -5410.773
          H1 Value                       -5410.773 Matches Stata (all variables in likelihood)
Information Criteria
          Akaike (AIC)                   10875.545
          Bayesian (BIC)                 10996.548
          Sample-Size Adjusted BIC       10910.823
            (n* = (n + 2) / 24)
Chi-Square Test of Model Fit
          Value                              0.000
          Degrees of Freedom                     0
          P-Value                           0.0000
RMSEA (Root Mean Square Error Of Approximation)
          Estimate                           0.000
          90 Percent C.I.                    0.000  0.000
          Probability RMSEA <= .05           0.000
CFI/TLI
          CFI                                1.000
          TLI                                1.000

Chi-Square Test of Model Fit for the Baseline Model
          Value                            439.601
          Degrees of Freedom                    15
          P-Value                           0.0000
SRMR (Standardized Root Mean Square Residual)
          Value                              0.000

MODEL RESULTS
                                                    Two-Tailed
                    Estimate       S.E.  Est./S.E.    P-Value
 NONTRAD  ON
    MIND1C            -0.012      0.189     -0.063      0.950
    INTERN             0.563      0.073      7.690      0.000
    EXTERN             0.058      0.076      0.761      0.446
    HOSTILE           -0.813      0.107     -7.571      0.000
    BENEV             -0.212      0.107     -1.981      0.048
 INTERN   ON
    MIND1C             0.335      0.116      2.880      0.004
 EXTERN   ON
    MIND1C             0.041      0.108      0.383      0.702
 HOSTILE  ON
    MIND1C            -0.196      0.074     -2.637      0.008
 BENEV    ON
    MIND1C            -0.052      0.070     -0.746      0.455
 INTERN   WITH
    EXTERN             0.602      0.067      8.938      0.000
    HOSTILE           -0.374      0.046     -8.206      0.000
    BENEV             -0.007      0.041     -0.165      0.869
 EXTERN   WITH
    HOSTILE            0.036      0.040      0.909      0.363
    BENEV              0.147      0.038      3.862      0.000
 HOSTILE  WITH
    BENEV              0.112      0.026      4.257      0.000
 Means
    MIND1C             0.835      0.017     48.266      0.000
 Intercepts
    INTERN             4.971      0.110     45.208      0.000
    EXTERN             4.063      0.102     39.929      0.000
    HOSTILE            4.069      0.070     58.010      0.000
    BENEV              4.109      0.066     62.245      0.000
    NONTRAD            7.457      0.731     10.203      0.000
 Variances
    MIND1C             0.195      0.011     18.069      0.000
 Residual Variances
    INTERN             1.729      0.096     18.070      0.000
    EXTERN             1.478      0.082     17.995      0.000
    HOSTILE            0.704      0.039     18.070      0.000
    BENEV              0.623      0.034     18.069      0.000
    NONTRAD            4.400      0.245     17.987      0.000
New/Additional Parameters – THESE ARE ALSO PROVIDED BY MODEL INDIRECT (ONLY FOR MVN OUTCOMES)
    XTOM1TOY           0.189      0.070      2.697      0.007
    XTOM2TOY           0.002      0.007      0.341      0.733
    XTOM3TOY           0.159      0.064      2.490      0.013
    XTOM4TOY           0.011      0.016      0.699      0.485
```

STATA SEM Syntax and Partial Output for Single-Group Path Model:

```
display as result "STATA Single-Group Path Model with Indirect Effects"
sem                                                       ///
    (intern extern hostile benev nontrad <- _cons)        /// All intercepts estimated (by default)
    (nontrad <- mindc)                                    /// Regression X to Y
    (intern extern hostile benev <- mindc)                /// Regressions X to M1,M2,M3,M4
    (nontrad <- intern extern hostile benev),             /// Regressions M1,M2,M3,M4 to Y
     means(mindc) var(mindc)                              /// Print X mean and variance (not default)
     var(e.intern e.extern e.hostile e.benev e.nontrad)   /// All residual variances (by default)
     covstruct(e.intern e.extern e.hostile e.benev, unstructured) /// All residual covariances
     method(mlmv)                                    // Full-information ML
     estat teffects                                  // Direct, indirect, and total effects (combined)
     nlcom _b[intern:mindc]*_b[nontrad:intern]       // Indirect effect XtoM1toY
     nlcom _b[extern:mindc]*_b[nontrad:extern]       // Indirect effect XtoM2toY
     nlcom _b[hostile:mindc]*_b[nontrad:hostile]     // Indirect effect XtoM3toY
     nlcom _b[benev:mindc]*_b[nontrad:benev]         // Indirect effect XtoM4toY
     sem, coeflegend                                 // Print parameter labels (to use in lincom)
     sem, standardized                               // Print standardized solution
     estat gof, stats(all),                          // Print model fit statistics
     estat eqgof,                                    // Print R2 per variable
```

```
Structural equation model                       Number of obs      =        653
Estimation method  = mlmv
Log likelihood     = -5410.7727

--------------------------------------------------------------------------------------------
                       |                 OIM
                       |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-----------------------+--------------------------------------------------------------------
Structural             |
  intern <-            |
                 mindc |   .3353112   .1164601     2.88   0.004     .1070536    .5635687
                 _cons |   4.971255   .1099664    45.21   0.000     4.755725    5.186785
  ---------------------+--------------------------------------------------------------------
  extern <-            |
                 mindc |    .041326   .1079943     0.38   0.702     -.170339     .252991
                 _cons |    4.06338   .1017661    39.93   0.000     3.863922    4.262838
  ---------------------+--------------------------------------------------------------------
  hostile <-           |
                 mindc |  -.1958762   .0742917    -2.64   0.008    -.3414852   -.0502672
                 _cons |   4.069324   .0701493    58.01   0.000     3.931834    4.206814
  ---------------------+--------------------------------------------------------------------
  benev <-             |
                 mindc |  -.0521908   .0699051    -0.75   0.455    -.1892022    .0848206
                 _cons |   4.108647   .0660072    62.25   0.000     3.979276    4.238019
  ---------------------+--------------------------------------------------------------------
  nontrad <-           |
                intern |   .5626147   .0731554     7.69   0.000     .4192328    .7059967
                extern |   .0578879   .0760251     0.76   0.446    -.0911186    .2068944
               hostile |  -.8125585    .107334    -7.57   0.000    -1.022929   -.6021878
                 benev |  -.2124246    .107228    -1.98   0.048    -.4225876   -.0022615
                 mindc |  -.0119824   .1889878    -0.06   0.949    -.3823917    .3584269
                 _cons |   7.456182   .7308971    10.20   0.000      6.02365    8.888714
-----------------------+--------------------------------------------------------------------
           mean(mindc)|   .8345001   .0172896    48.27   0.000     .8006132    .8683871
-----------------------+--------------------------------------------------------------------
         var(e.intern)|   1.728817    .095677                      1.551106    1.926889
         var(e.extern)|   1.477754   .0821223                      1.325253    1.647804
        var(e.hostile)|   .7035186   .0389344                      .6312015    .7841211
          var(e.benev)|   .6228914   .0344723                      .5588622    .6942564
        var(e.nontrad)|   4.400699   .2446747                      3.946351    4.907358
            var(mindc)|    .195201   .0108029                      .1751356    .2175653
-----------------------+--------------------------------------------------------------------
 cov(e.intern,e.extern)|   .6021503   .0673758     8.94   0.000     .4700961    .7342044
cov(e.intern,e.hostile)|  -.3739513    .045571    -8.21   0.000    -.4632688   -.2846338
  cov(e.intern,e.benev)|  -.0067172     .04061    -0.17   0.869    -.0863114     .072877
cov(e.extern,e.hostile)|   .0364342   .0401216     0.91   0.364    -.0422026    .1150711
  cov(e.extern,e.benev)|    .146955   .0380589     3.86   0.000     .0723609     .221549
 cov(e.hostile,e.benev)|   .1118392   .0262723     4.26   0.000     .0603464     .163332
--------------------------------------------------------------------------------------------
LR test of model vs. saturated: chi2(0)   =      0.00, Prob > chi2 =      .
```

```
.         nlcom _b[intern:mindc]*_b[nontrad:intern]   // indirect effect XtoM1toY
       _nl_1:  _b[intern:mindc]*_b[nontrad:intern]
------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _nl_1 |    .188651   .0699633     2.70   0.007     .0515254    .3257765
------------------------------------------------------------------------------
.         nlcom _b[extern:mindc]*_b[nontrad:extern]   // indirect effect XtoM2toY
       _nl_1:  _b[extern:mindc]*_b[nontrad:extern]
------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _nl_1 |   .0023923   .0070151     0.34   0.733    -.0113572    .0161417
------------------------------------------------------------------------------
.         nlcom _b[hostile:mindc]*_b[nontrad:hostile] // indirect effect XtoM3toY
       _nl_1:  _b[hostile:mindc]*_b[nontrad:hostile]
------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _nl_1 |   .1591609   .0639227     2.49   0.013     .0338747    .2844471
------------------------------------------------------------------------------
.         nlcom _b[benev:mindc]*_b[nontrad:benev]     // indirect effect XtoM4toY
       _nl_1:  _b[benev:mindc]*_b[nontrad:benev]
------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _nl_1 |   .0110866   .0158691     0.70   0.485    -.0200162    .0421894
------------------------------------------------------------------------------

----------------------------------------------------------------------------
Fit statistic        |      Value   Description
---------------------+------------------------------------------------------
Likelihood ratio     |
          chi2_ms(0) |      0.000   model vs. saturated
            p > chi2 |          .
         chi2_bs(15) |    439.601   baseline vs. saturated
            p > chi2 |      0.000
---------------------+------------------------------------------------------
Population error     |
               RMSEA |      0.000   Root mean squared error of approximation
 90% CI, lower bound |      0.000
         upper bound |      0.000
              pclose |      1.000   Probability RMSEA <= 0.05
---------------------+------------------------------------------------------
Information criteria |
                 AIC |  10871.545   Akaike's information criterion
                 BIC |  10983.585   Bayesian information criterion
---------------------+------------------------------------------------------
Baseline comparison  |
                 CFI |      1.000   Comparative fit index
                 TLI |      1.000   Tucker-Lewis index
---------------------+------------------------------------------------------
Size of residuals    |
                  CD |      0.018   Coefficient of determination
----------------------------------------------------------------------------
Note: SRMR is not reported because of missing values.


Equation-level goodness of fit
------------------------------------------------------------------------------
             |              Variance             |
     depvars |    fitted  predicted   residual | R-squared        mc      mc2
-------------+---------------------------------+------------------------------
observed     |                                 |
      intern |  1.750765   .0219471   1.728817 |  .0125357  .1119632  .0125357
      extern |  1.478088   .0003334   1.477754 |  .0002255  .0150181  .0002255
     hostile |    .711008   .0074894   .7035186 |  .0105335  .1026326  .0105335
       benev |  .6234231   .0005317   .6228914 |  .0008529  .0292041  .0008529
     nontrad |  5.883612   1.482912   4.400699 |  .2520411   .502037  .2520411
-------------+---------------------------------+------------------------------
     overall |                                 |  .0176456
------------------------------------------------------------------------------
mc  = correlation between depvar and its prediction
mc2 = mc^2 is the Bentler-Raykov squared multiple correlation coefficient
```

SAS PROC CALIS Syntax for Multiple-Group Path Model (all parameters separate by gender):

```
TITLE1 "SAS Multiple-Group Path Model with Indirect Effects";
PROC CALIS DATA=work.Mindfull MEANSTR METHOD=FIML;
* VAR = List of variables in model;
  VAR  MindC Intern Extern Hostile Benev Nontrad;
* GROUP creates separate models (referred to by number);
  GROUP 1 / LABEL="Men"   DATA=work.Men;
  GROUP 2 / LABEL="Women" DATA=work.Women;
* Model for Men -- all parameters are now labeled separately for full non-invariance;
  MODEL 1 / GROUP=1;
  MEAN MindC=mXint, Intern=mM1int, Extern=mM2int, Hostile=mM3int, Benev=mM4int, NonTrad=mYint;
  PVAR MindC=mXvar, Intern=mM1var, Extern=mM2var, Hostile=mM3var, Benev=mM4var, NonTrad=mYvar;
  PCOV Intern Extern=mCovM12, Intern Hostile=mCovM13, Intern Benev=mCovM14,
       Extern Hostile=mCovM23, Extern Benev=mCovM24, Hostile Benev=mCov34;
  PATH MindC ---> NonTrad = mXtoY,
       MindC ---> Intern Extern Hostile Benev = mXtoM1 mXtoM2 mXtoM3 mXtoM4,
       Intern Extern Hostile Benev ---> NonTrad = mM1toY mM2toY mM3toY mM4toY;
* Model for Women -- all parameters are now labeled separately for full non-invariance;;
  MODEL 2 / GROUP=2;
  MEAN MindC=wXint, Intern=wM1int, Extern=wM2int, Hostile=wM3int, Benev=wM4int, NonTrad=wYint;
  PVAR MindC=wXvar, Intern=wM1var, Extern=wM2var, Hostile=wM3var, Benev=wM4var, NonTrad=wYvar;
  PCOV Intern Extern=wCovM12, Intern Hostile=wCovM13, Intern Benev=wCovM14,
       Extern Hostile=wCovM23, Extern Benev=wCovM24, Hostile Benev=wCov34;
  PATH MindC ---> NonTrad = wXtoY,
       MindC ---> Intern Extern Hostile Benev = wXtoM1 wXtoM2 wXtoM3 wXtoM4,
       Intern Extern Hostile Benev ---> NonTrad = wM1toY wM2toY wM3toY wM4toY;
* Indirect effects for both groups;
  TESTFUNC mXtoM1toY wXtoM1toY mXtoM2toY wXtoM2toY mXtoM3toY wXtoM3toY mXtoM4toY wXtoM4toY;
           mXtoM1toY = mXtoM1*mM1toY; wXtoM1toY = wXtoM1*wM1toY;
           mXtoM2toY = mXtoM2*mM2toY; wXtoM2toY = wXtoM2*wM2toY;
           mXtoM3toY = mXtoM2*mM2toY; wXtoM3toY = wXtoM3*wM3toY;
           mXtoM4toY = mXtoM2*mM2toY; wXtoM4toY = wXtoM4*wM4toY;
RUN; TITLE1;
```

Mplus Syntax and Output for Multiple-Group Path Model (all parameters separate by gender):

```
TITLE:  Mplus Example 6a Multiple-Group Path Model with Indirect Effects
DATA:   FILE IS Mindfull_Example.csv; ! Can just list file name if in same folder
        FORMAT = free;                ! FREE (default) or FIXED format
        TYPE = individual;            ! Individual (default) or matrix data as input
VARIABLE:
! Names of all variables in data set
  NAMES ARE pin1 SexMW age Mind1 Mind2 Hostile Benev Intern Extern
            NonTrado Career Fem WomMov;
! Names of all variables in model
  USEVARIABLES ARE SexMW Intern Extern Hostile Benev MindC NonTrad;
! Missing data indicator
  MISSING ARE ALL(-999);
! Grouping variable for multiple group analysis
  GROUPING IS SexMW (0=Men, 1=Women);

DEFINE:
! Center mindfulness at 2 (out of 1 to 4)
  MindC = Mind1 - 2;
! Mean of feminists and womens' movement
  NonTrad = (Fem + WomMov) / 2;

ANALYSIS:   TYPE IS GENERAL;          ! For path models
            ESTIMATOR IS ML;          ! Regular ML for use with bootstrapping
            !BOOTSTRAP IS 1000;       ! Bootstrapping for indirect effects
OUTPUT:     STDYX;                    ! Standardized solution
            !MODINDICES (3.84);       ! Test constraints without bootstrapping
            CINTERVAL;                ! Confidence interval for indirect effects
            !CINTERVAL(BCBOOTSTRAP); ! Bootstrap CI for indirect effects
```

GROUPING defines groups for multiple-group model for MVN outcomes.

```
! Model code: ON = Y ON X, WITH = correlation
! Labels in parentheses (can be used to name constraints between groups)
MODEL:
! Bring X into the likelihood by estimating its mean and variance
  [MindC] (mXint); MindC (mXvar);
! Intercepts and residual variances for other variables
  [Intern Extern Hostile Benev NonTrad] (mM1int mM2int mM3int mM4int mYint);
   Intern Extern Hostile Benev NonTrad  (mM1var mM2var mM3var mM4var mYvar);
! Direct MindC --> NonTrad
  NonTrad  ON MindC (mXtoY);
! Left side of model
  Intern Extern Hostile Benev  ON MindC (mXtoM1 mXtoM2 mXtoM3 mXtoM4);
! Right side of model
  NonTrad ON Intern Extern Hostile Benev (mM1toY mM2toY mM3toY mM4toY);
! Residual covariances among mediator variables
  Intern Extern Hostile Benev WITH Intern Extern Hostile Benev;
! Testing indirect effects
  MODEL CONSTRAINT:
  NEW (mXtoM1Y mXtoM2Y mXtoM3Y mXtoM4Y);
  mXtoM1Y = mXtoM1*mM1toY; mXtoM2Y = mXtoM2*mM2toY;
  mXtoM3Y = mXtoM3*mM3toY; mXtoM4Y = mXtoM4*mM4toY;

MODEL Women:
! Bring X into the likelihood by estimating its mean and variance
  [MindC] (wXint); MindC (wXvar);
! Intercepts and residual variances for other variables
  [Intern Extern Hostile Benev NonTrad] (wM1int wM2int wM3int wM4int wYint);
   Intern Extern Hostile Benev NonTrad  (wM1var wM2var wM3var wM4var wYvar);
! Direct MindC --> NonTrad
  NonTrad  ON MindC (wXtoY);
! Left side of model
  Intern Extern Hostile Benev  ON MindC (wXtoM1 wXtoM2 wXtoM3 wXtoM4);
! Right side of model
  NonTrad ON Intern Extern Hostile Benev (wM1toY wM2toY wM3toY wM4toY);
! Residual covariances among mediator variables
  Intern Extern Hostile Benev WITH Intern Extern Hostile Benev;
! Testing indirect effects
  MODEL CONSTRAINT:
  NEW (wXtoM1Y wXtoM2Y wXtoM3Y wXtoM4Y);
  wXtoM1Y = wXtoM1*wM1toY; wXtoM2Y = wXtoM2*wM2toY;
  wXtoM3Y = wXtoM3*wM3toY; wXtoM4Y = wXtoM4*wM4toY;

! Get all indirect effects between Y IND X
MODEL INDIRECT: ! Only available for MVN outcomes
NonTrad IND MindC;
```

```
MODEL FIT INFORMATION
Number of Free Parameters                       54
Loglikelihood
          H0 Value                       -5332.207
          H1 Value                       -5332.207
Information Criteria
          Akaike (AIC)                   10772.414
          Bayesian (BIC)                 11014.420
          Sample-Size Adjusted BIC       10842.970
            (n* = (n + 2) / 24)
Chi-Square Test of Model Fit
          Value                              0.000
          Degrees of Freedom                     0
          P-Value                           0.0000
Chi-Square Contribution From Each Group
          MEN                                0.000
          WOMEN                              0.000

RMSEA (Root Mean Square Error Of Approximation)
          Estimate                           0.000
          90 Percent C.I.                    0.000  0.000
          Probability RMSEA <= .05           0.000
CFI/TLI
          CFI                                1.000
          TLI                                1.000
```

```
Chi-Square Test of Model Fit for the Baseline Model
          Value                            399.257
          Degrees of Freedom                    30
          P-Value                           0.0000
SRMR (Standardized Root Mean Square Residual)
          Value                              0.000

MODEL RESULTS
                                                    Two-Tailed
                    Estimate       S.E.  Est./S.E.    P-Value
Group MEN
 NONTRAD  ON
    MIND1C             0.213      0.301      0.707      0.479
    INTERN             0.548      0.110      4.995      0.000
    EXTERN             0.047      0.113      0.419      0.675
    HOSTILE           -0.845      0.156     -5.402      0.000
    BENEV             -0.158      0.159     -0.991      0.322
 INTERN   ON
    MIND1C             0.633      0.191      3.324      0.001
 EXTERN   ON
    MIND1C             0.273      0.173      1.581      0.114
 HOSTILE  ON
    MIND1C            -0.171      0.124     -1.385      0.166
 BENEV    ON
    MIND1C            -0.314      0.110     -2.842      0.004
 INTERN   WITH
    EXTERN             0.640      0.110      5.807      0.000
    HOSTILE           -0.475      0.078     -6.047      0.000
    BENEV              0.107      0.065      1.633      0.102
 EXTERN   WITH
    HOSTILE            0.058      0.067      0.869      0.385
    BENEV              0.154      0.060      2.576      0.010
 HOSTILE  WITH
    BENEV              0.036      0.042      0.846      0.397
 Means
    MIND1C             0.817      0.026     31.181      0.000
 Intercepts
    INTERN             4.391      0.176     24.928      0.000
    EXTERN             3.871      0.159     24.272      0.000
    HOSTILE            4.334      0.114     37.859      0.000
    BENEV              4.460      0.102     43.703      0.000
    NONTRAD            6.814      1.125      6.059      0.000
 Variances
    MIND1C             0.187      0.016     11.683      0.000
 Residual Variances
    INTERN             1.857      0.159     11.683      0.000
    EXTERN             1.522      0.131     11.636      0.000
    HOSTILE            0.784      0.067     11.683      0.000
    BENEV              0.623      0.053     11.683      0.000
    NONTRAD            4.124      0.356     11.576      0.000

Group WOMEN
 NONTRAD  ON
    MIND1C            -0.126      0.239     -0.528      0.597
    INTERN             0.449      0.097      4.626      0.000
    EXTERN             0.084      0.099      0.847      0.397
    HOSTILE           -0.535      0.150     -3.566      0.000
    BENEV             -0.159      0.144     -1.105      0.269
 INTERN   ON
    MIND1C             0.099      0.139      0.709      0.478
 EXTERN   ON
    MIND1C            -0.117      0.138     -0.846      0.397
 HOSTILE  ON
    MIND1C            -0.181      0.085     -2.143      0.032
 BENEV    ON
    MIND1C             0.138      0.087      1.582      0.114
 INTERN   WITH
    EXTERN             0.556      0.080      6.934      0.000
    HOSTILE           -0.184      0.047     -3.913      0.000
    BENEV             -0.012      0.048     -0.245      0.806
 EXTERN   WITH
    HOSTILE            0.023      0.045      0.508      0.612
    BENEV              0.157      0.048      3.285      0.001
 HOSTILE  WITH
    BENEV              0.118      0.030      4.008      0.000
 Means
    MIND1C             0.847      0.023     36.886      0.000
```

```
 Intercepts
    INTERN             5.414      0.133     40.622      0.000
    EXTERN             4.200      0.132     31.900      0.000
    HOSTILE            3.853      0.081     47.513      0.000
    BENEV              3.848      0.084     45.915      0.000
    NONTRAD            7.172      0.938      7.646      0.000
 Variances
    MIND1C             0.200      0.015     13.784      0.000
 Residual Variances
    INTERN             1.473      0.107     13.784      0.000
    EXTERN             1.433      0.104     13.732      0.000
    HOSTILE            0.545      0.040     13.784      0.000
    BENEV              0.583      0.042     13.784      0.000
    NONTRAD            4.230      0.307     13.765      0.000
New/Additional Parameters
    MXTOM1Y            0.347      0.125      2.767      0.006
    MXTOM2Y            0.013      0.032      0.405      0.685
    MXTOM3Y            0.145      0.108      1.341      0.180
    MXTOM4Y            0.050      0.053      0.935      0.350
    WXTOM1Y            0.044      0.063      0.701      0.483
    WXTOM2Y           -0.010      0.016     -0.602      0.547
    WXTOM3Y            0.097      0.053      1.837      0.066
    WXTOM4Y           -0.022      0.024     -0.906      0.365
```

STATA SEM Syntax and Partial Output for Multiple-Group Path Model (all parameters separate by gender):

```
display as result "STATA Multiple-Group Path Model with Indirect Effects"
sem                                                        ///
    (intern extern hostile benev nontrad <- _cons)         /// All intercepts estimated (by default)
    (nontrad <- mindc)                                     /// Regression X to Y
    (intern extern hostile benev <- mindc)                 /// Regressions X to M1,M2,M3,M4
    (nontrad <- intern extern hostile benev),              /// Regressions M1,M2,M3,M4 to Y
     means(mindc) var(mindc)                               /// Print X mean and variance (not default)
     var(e.intern e.extern e.hostile e.benev e.nontrad)  /// All residual variances (by default)
     covstruct(e.intern e.extern e.hostile e.benev, unstructured) /// All residual covariances
     method(mlmv)                                    /// Full-information ML
     group(sexmw) ginvariant(none),                  // none= full non-invariance
     estat teffects                                  // Direct, indirect, and total effects (combined)
     // men and women indirect effect XtoM1toY
     nlcom _b[intern:0bn.sexmw#c.mindc]*_b[nontrad:0bn.sexmw#c.intern]
     nlcom _b[intern:1.sexmw#c.mindc]*_b[nontrad:1.sexmw#c.intern]
     // men and women indirect effect XtoM2toY
     nlcom _b[extern:0bn.sexmw#c.mindc]*_b[nontrad:0bn.sexmw#c.extern]
     nlcom _b[extern:1.sexmw#c.mindc]*_b[nontrad:1.sexmw#c.extern]
     // men and women indirect effect XtoM3toY
     nlcom _b[hostile:0bn.sexmw#c.mindc]*_b[nontrad:0bn.sexmw#c.hostile]
     nlcom _b[hostile:1.sexmw#c.mindc]*_b[nontrad:1.sexmw#c.hostile]
     // men and women indirect effect XtoM4toY
     nlcom _b[benev:0bn.sexmw#c.mindc]*_b[nontrad:0bn.sexmw#c.benev]
     nlcom _b[benev:1.sexmw#c.mindc]*_b[nontrad:1.sexmw#c.benev]
     sem, coeflegend                                  // Print parameter labels (to use in lincom)
     sem, standardized                                // Print standardized solution
     estat gof, stats(all),                           // Print model fit statistics
     estat eqgof,                                     // Print R2 per variable
     estat ginvariant,     // Wald or Score test for each parm's invariance
                           // Wald  = test of constraining equal if unequal
                           // Score = test of allowing unequal if equal
```

```
Structural equation model                      Number of obs      =       653
Grouping variable  = sexmw                     Number of groups   =         2
Estimation method  = mlmv
Log likelihood     = -5332.2072
--------------------------------------------------------------------------------------
                       |                 OIM
                       |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-----------------------+--------------------------------------------------------------
Structural             |
  intern <-            |
                 mindc |
                     0 |    .633305   .1905479     3.32   0.001     .2598381    1.006772
                     1 |   .0986061   .1390832     0.71   0.478     -.173992    .3712041
```

```
              _cons |
                 0  |    4.39111   .1761513    24.93   0.000      4.04586     4.73636
                 1  |     5.4137   .1332709    40.62   0.000     5.152494    5.674906
  ------------------+----------------------------------------------------------------
  extern <-         |
              mindc |
                 0  |   .2727332   .1725529     1.58   0.114    -.0654644    .6109308
                 1  |  -.1166402   .1378333    -0.85   0.397    -.3867886    .1535081
              _cons |
                 0  |   3.870788   .1594745    24.27   0.000     3.558224    4.183352
                 1  |   4.199539   .1316457    31.90   0.000     3.941519     4.45756
  ------------------+----------------------------------------------------------------
  hostile <-        |
              mindc |
                 0  |  -.1714754   .1238283    -1.38   0.166    -.4141744    .0712236
                 1  |  -.1813362   .0846223    -2.14   0.032    -.3471929   -.0154795
              _cons |
                 0  |   4.333876   .1144726    37.86   0.000     4.109514    4.558238
                 1  |   3.852628   .0810859    47.51   0.000     3.693702    4.011553
  ------------------+----------------------------------------------------------------
  benev <-          |
              mindc |
                 0  |  -.3137449   .1103874    -2.84   0.004    -.5301002   -.0973897
                 1  |   .1383824   .0874718     1.58   0.114    -.0330592    .3098239
              _cons |
                 0  |   4.459746   .1020472    43.70   0.000     4.259737    4.659755
                 1  |   3.848452   .0838163    45.92   0.000     3.684175    4.012729
  ------------------+----------------------------------------------------------------
  nontrad <-        |
             intern |
                 0  |   .5480012   .1097146     4.99   0.000     .3329645     .763038
                 1  |   .4488746   .0970253     4.63   0.000     .2587086    .6390407
             extern |
                 0  |   .0473828   .1130167     0.42   0.675    -.1741259    .2688915
                 1  |   .0836082   .0987572     0.85   0.397    -.1099524    .2771687
            hostile |
                 0  |  -.8451654   .1564635    -5.40   0.000    -1.151828   -.5385025
                 1  |  -.5347936   .1499501    -3.57   0.000    -.8286905   -.2408967
              benev |
                 0  |  -.1578276   .1593142    -0.99   0.322    -.4700778    .1544226
                 1  |  -.1591458   .1440195    -1.11   0.269    -.4414189    .1231274
              mindc |
                 0  |   .2131587   .3014609     0.71   0.480    -.3776937    .8040111
                 1  |  -.1263696    .239163    -0.53   0.597    -.5951205    .3423813
              _cons |
                 0  |   6.814568   1.124616     6.06   0.000     4.610361    9.018774
                 1  |   7.172311   .9379938     7.65   0.000     5.333877    9.010746
--------------------+----------------------------------------------------------------
        mean(mindc)|
                 0  |   .8168498   .0261972    31.18   0.000     .7655043    .8681953
                 1  |   .8471805   .0229674    36.89   0.000     .8021651    .8921958
--------------------+----------------------------------------------------------------
      var(e.intern)|
                 0  |   1.857129   .1589556                      1.570312    2.196333
                 1  |   1.473471   .1068968                      1.278171    1.698612
      var(e.extern)|
                 0  |   1.522092   .1308062                      1.286145    1.801324
                 1  |   1.433397   .1043813                      1.242743    1.653301
     var(e.hostile)|
                 0  |   .7842846   .0671286                      .6631588    .9275339
                 1  |   .5454591   .0395718                      .4731617    .6288033
       var(e.benev)|
                 0  |   .6232648   .0533465                      .5270071    .7371039
                 1  |   .5828119   .0422816                      .5055636    .6718636
     var(e.nontrad)|
                 0  |   4.124248    .356281                      3.481866    4.885144
                 1  |   4.230226   .3073067                       3.66883    4.877525
         var(mindc)|
                 0  |   .1873576   .0160363                      .1584219    .2215784
                 1  |   .2004512   .0145423                      .1738826    .2310795
--------------------+----------------------------------------------------------------
 cov(e.intern,e.extern)|
                 0  |   .6395836   .1101316     5.81   0.000     .4237297    .8554375
                 1  |   .5559517   .0801768     6.93   0.000      .398808    .7130954
cov(e.intern,e.hostile)|
                 0  |  -.4745932   .0784874    -6.05   0.000    -.6284257   -.3207606
                 1  |  -.1836749   .0469449    -3.91   0.000    -.2756853   -.0916645
```

```
  cov(e.intern,e.benev)|
                    0  |   .1068751   .0654347     1.63   0.102    -.0213747    .2351248
                    1  |  -.0116527    .047542    -0.25   0.806    -.1048333     .081528

cov(e.extern,e.hostile)|
                    0  |   .0579838   .0667428     0.87   0.385    -.0728297    .1887972
                    1  |   .0230488   .0454018     0.51   0.612    -.0659371    .1120347
  cov(e.extern,e.benev)|
                    0  |   .1540697   .0598145     2.58   0.010     .0368354     .271304
                    1  |   .1566726   .0476864     3.29   0.001      .063209    .2501362
 cov(e.hostile,e.benev)|
                    0  |    .035857   .0423704     0.85   0.397    -.0471874    .1189014
                    1  |   .1184571   .0295551     4.01   0.000     .0605301    .1763841
---------------------------------------------------------------------------------------
LR test of model vs. saturated: chi2(0)   =      0.00, Prob > chi2 =      .

.          // men and women indirect effect XtoM1toY
.          nlcom _b[intern:0bn.sexmw#c.mindc]*_b[nontrad:0bn.sexmw#c.intern]
       _nl_1:  _b[intern:0bn.sexmw#c.mindc]*_b[nontrad:0bn.sexmw#c.intern]
------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _nl_1 |   .3470519   .1254253     2.77   0.006     .1012229     .592881
------------------------------------------------------------------------------
.          nlcom _b[intern:1.sexmw#c.mindc]*_b[nontrad:1.sexmw#c.intern]
       _nl_1:  _b[intern:1.sexmw#c.mindc]*_b[nontrad:1.sexmw#c.intern]
------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _nl_1 |   .0442618   .0631597     0.70   0.483     -.079529    .1680526
------------------------------------------------------------------------------
.          // men and women indirect effect XtoM2toY
.          nlcom _b[extern:0bn.sexmw#c.mindc]*_b[nontrad:0bn.sexmw#c.extern]
       _nl_1:  _b[extern:0bn.sexmw#c.mindc]*_b[nontrad:0bn.sexmw#c.extern]
------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _nl_1 |   .0129229   .0318837     0.41   0.685    -.0495681    .0754138
------------------------------------------------------------------------------
.          nlcom _b[extern:1.sexmw#c.mindc]*_b[nontrad:1.sexmw#c.extern]
       _nl_1:  _b[extern:1.sexmw#c.mindc]*_b[nontrad:1.sexmw#c.extern]
------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _nl_1 |  -.0097521   .0162089    -0.60   0.547    -.0415209    .0220168
------------------------------------------------------------------------------
.          // men and women indirect effect XtoM3toY
.          nlcom _b[hostile:0bn.sexmw#c.mindc]*_b[nontrad:0bn.sexmw#c.hostile]
       _nl_1:  _b[hostile:0bn.sexmw#c.mindc]*_b[nontrad:0bn.sexmw#c.hostile]
------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _nl_1 |   .1449251   .1080397     1.34   0.180    -.0668289     .356679
------------------------------------------------------------------------------
.          nlcom _b[hostile:1.sexmw#c.mindc]*_b[nontrad:1.sexmw#c.hostile]
       _nl_1:  _b[hostile:1.sexmw#c.mindc]*_b[nontrad:1.sexmw#c.hostile]
------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _nl_1 |   .0969775   .0527961     1.84   0.066     -.006501     .200456
------------------------------------------------------------------------------
.          // men and women indirect effect XtoM4toY
.          nlcom _b[benev:0bn.sexmw#c.mindc]*_b[nontrad:0bn.sexmw#c.benev]
       _nl_1:  _b[benev:0bn.sexmw#c.mindc]*_b[nontrad:0bn.sexmw#c.benev]
------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _nl_1 |   .0495176   .0529333     0.94   0.350    -.0542298     .153265
------------------------------------------------------------------------------
.          nlcom _b[benev:1.sexmw#c.mindc]*_b[nontrad:1.sexmw#c.benev]
       _nl_1:  _b[benev:1.sexmw#c.mindc]*_b[nontrad:1.sexmw#c.benev]
------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _nl_1 |   -.022023   .0243101    -0.91   0.365      -.06967     .025624
------------------------------------------------------------------------------
```

Group #1 (sexmw=0; N=273)
Equation-level goodness of fit

depvars	fitted	Variance predicted	residual	R-squared	mc	mc2
observed						
intern	1.932273	.0751445	1.857129	.0388892	.1972033	.0388892
extern	1.536028	.0139363	1.522092	.0090729	.095252	.0090729
hostile	.7897936	.005509	.7842846	.0069753	.0835181	.0069753
benev	.6417075	.0184427	.6232648	.0287401	.1695289	.0287401
nontrad	5.828462	1.704215	4.124248	.2923952	.5407358	.2923952
overall				.0757179		

Group #2 (sexmw=1; N=380)
Equation-level goodness of fit

depvars	fitted	Variance predicted	residual	R-squared	mc	mc2
observed						
intern	1.47542	.001949	1.473471	.001321	.0363455	.001321
extern	1.436124	.0027271	1.433397	.0018989	.0435769	.0018989
hostile	.5520505	.0065914	.5454591	.0119399	.1092697	.0119399
benev	.5866505	.0038386	.5828119	.0065432	.0808901	.0065432
nontrad	4.853467	.623241	4.230226	.1284115	.3583455	.1284115
overall				.0283625		

mc = correlation between depvar and its prediction
mc2 = mc^2 is the Bentler-Raykov squared multiple correlation coefficient

Fit statistic	Value	Description
Likelihood ratio		
chi2_ms(0)	0.000	model vs. saturated
p > chi2	.	
chi2_bs(30)	399.257	baseline vs. saturated
p > chi2	0.000	
Population error		
RMSEA	0.000	Root mean squared error of approximation
90% CI, lower bound	0.000	
upper bound	0.000	
Information criteria		
AIC	10764.414	Akaike's information criterion
BIC	10988.493	Bayesian information criterion
Baseline comparison		
CFI	1.000	Comparative fit index
TLI	1.000	Tucker-Lewis index
Size of residuals		
CD	0.055	Coefficient of determination

Note: pclose is not reported because of multiple groups.
Note: SRMR is not reported because of missing values.

Tests for group invariance of parameters

		Wald Test			Score Test		
		chi2	df	p>chi2	chi2	df	p>chi2
Structural							
nontrad <-	intern	0.458	1	0.4985	.	.	.
	extern	0.058	1	0.8093	.	.	.
	hostile	2.051	1	0.1521	.	.	.
	benev	0.000	1	0.9951	.	.	.
	mindc	0.779	1	0.3776	.	.	.
	_cons	0.060	1	0.8070	.	.	.
intern <-	mindc	5.137	1	0.0234	.	.	.
	_cons	21.432	1	0.0000	.	.	.

```
  ---------------------+----------------------------------------------------------------
  extern <-      mindc |      3.109          1    0.0779          .           .         .
                 _cons |      2.527          1    0.1119          .           .         .
  ---------------------+----------------------------------------------------------------
  hostile <-     mindc |      0.004          1    0.9476          .           .         .
                 _cons |     11.769          1    0.0006          .           .         .
  ---------------------+----------------------------------------------------------------
  benev <-       mindc |     10.305          1    0.0013          .           .         .
                 _cons |     21.428          1    0.0000          .           .         .
-----------------------+----------------------------------------------------------------
         var(e.nontrad)|      0.051          1    0.8218          .           .         .
          var(e.intern)|      4.011          1    0.0452          .           .         .
          var(e.extern)|      0.281          1    0.5961          .           .         .
         var(e.hostile)|      9.393          1    0.0022          .           .         .
           var(e.benev)|      0.353          1    0.5523          .           .         .
-----------------------+----------------------------------------------------------------
 cov(e.intern,e.extern)|      0.377          1    0.5393          .           .         .
cov(e.intern,e.hostile)|     10.119          1    0.0015          .           .         .
  cov(e.intern,e.benev)|      2.147          1    0.1428          .           .         .
cov(e.extern,e.hostile)|      0.187          1    0.6652          .           .         .
  cov(e.extern,e.benev)|      0.001          1    0.9729          .           .         .
 cov(e.hostile,e.benev)|      2.557          1    0.1098          .           .         .
----------------------------------------------------------------------------------------
```

SAS PROC CALIS New Syntax for XtoM1 path now equal across genders

```
TITLE1 "SAS Multiple-Group Path Model -- XtoM1 equal by gender";
TITLE2 "Model chi-square provides test of 1 new constraint";
  MODEL 1 / GROUP=1;
  PATH
       MindC ---> Intern Extern Hostile Benev = XtoM1 mXtoM2 mXtoM3 mXtoM4,
  MODEL 2 / GROUP=2;
  PATH
       MindC ---> Intern Extern Hostile Benev = XtoM1 wXtoM2 wXtoM3 wXtoM4,
```

Mplus New Syntax and Partial Output for XtoM1 path now equal across genders

```
MODEL:
  Intern  ON MindC  (XtoM1);
MODEL Women:
  Intern  ON MindC  (XtoM1);
```

```
MODEL FIT INFORMATION
Number of Free Parameters                        53
Loglikelihood
          H0 Value                        -5334.764
          H1 Value                        -5332.207

Information Criteria
          Akaike (AIC)                    10775.527
          Bayesian (BIC)                  11013.051
          Sample-Size Adjusted BIC        10844.776
            (n* = (n + 2) / 24)
Chi-Square Test of Model Fit
          Value                               5.113 → This is the LRT for equality of XtoM1
          Degrees of Freedom                      1
          P-Value                            0.0238
Chi-Square Contribution From Each Group
          MEN                                 3.350
          WOMEN                               1.762

RMSEA (Root Mean Square Error Of Approximation)
          Estimate                            0.112
          90 Percent C.I.                     0.033  0.216
          Probability RMSEA <= .05            0.088
CFI/TLI
          CFI                                 0.989
          TLI                                 0.666
SRMR (Standardized Root Mean Square Residual)
          Value                               0.022
```

STATA SEM New Syntax and Partial Output for XtoM1 path now equal across genders

```
display as result "STATA Testing Equality of Direct effect XtoM1"
display as result "Model chi-square gives test of 1 new constraint"
sem                                                   ///
    (intern extern hostile benev nontrad <- _cons)    /// All intercepts estimated (by default)
    (nontrad <- mindc)                                /// X to Y for both groups
    (0: intern@a extern hostile benev <- mindc)       /// X to M1,M2,M3,M4 for group 0
    (1: intern@a extern hostile benev <- mindc)       /// X to M1,M2,M3,M4 for group 1
    (nontrad <- intern extern hostile benev)          /// M1,M2,M3,M4 to Y for both groups
```

```
----------------------------------------------------------------------------
Fit statistic        |      Value   Description
---------------------+------------------------------------------------------
Likelihood ratio     |
          chi2_ms(1) |      5.113   model vs. saturated → This is the LRT for equality of XtoM1
            p > chi2 |      0.024
         chi2_bs(30) |    399.257   baseline vs. saturated → Not relevant (still)
            p > chi2 |      0.000
---------------------+------------------------------------------------------
Population error     |
               RMSEA |      0.112   Root mean squared error of approximation
 90% CI, lower bound |      0.033
         upper bound |      0.216
---------------------+------------------------------------------------------
Information criteria |
                 AIC |  10775.527   Akaike's information criterion
                 BIC |  11013.051   Bayesian information criterion
---------------------+------------------------------------------------------
Baseline comparison  |
                 CFI |      0.989   Comparative fit index
                 TLI |      0.666   Tucker-Lewis index
---------------------+------------------------------------------------------
Size of residuals    |
                  CD |      0.043   Coefficient of determination
----------------------------------------------------------------------------
Note: pclose is not reported because of multiple groups.
Note: SRMR is not reported because of missing values.
```

The rest of the direct effects were tested similarly (constrain the path to be equal across genders, examine model misfit).

Indirect effects were tested by constraining both involved direct paths to be equal (mislabeled in the manuscript as DF=1 when it should be DF=2), although this is a conservative approach (i.e., one could also make an argument for testing the difference in the indirect effect specifically using MODEL CONSTRAINT and DF=1). Given that there are infinitely many ways two different sets of direct effects could yield the same indirect effect, it seems testing the direct effects specifically would be more informative as to what extent the pattern implied by the indirect effect differs across groups.

For a sample results section, please see the original manuscript.